

## **REMARKS**

Initially, the Examiner indicated that claims 2 – 9, 19, and 23 – 25 would be allowable if rewritten in independent form. Applicant appreciates the indication of allowable subject matter, but has chosen not to amend these claims at this time in light of the remarks below pertaining to the corresponding base claims.

The Examiner also did not provide an indication regarding the status of claims 26 – 35, which Applicant assumes are considered to be allowable. A formal indication to this effect is respectfully requested.

Finally, in the Action, the Examiner rejected claim 1 under 35 U.S.C. § 102(e) as anticipated by *Daniels et al.* (U.S. Patent No. 6,389,886); rejected claim 15 under 35 U.S.C. § 102(b) as anticipated by *Quate* (U.S. Patent No. 5,517,280); and rejected claims 16, 17 and 19 – 22 under 35 U.S.C. § 103(a) as being unpatentable over *Quate* in view of *Daniels et al.* Applicant respectfully disagrees.

### **A. Present Invention**

The following summary of the technology is simplified for purposes of this Reply, and should not be considered to constitute an argument in and of itself, and does not limit the scope of the invention or act as an estoppel for the purpose of future argument.

In atomic force microscopes (AFMs), the sensing probe deflects during operation, providing an indication of one or more surface characteristics (“operational deflection”). To the contrary, the type of cantilever bending or deflection addressed by the present invention is not operational deflection, but a substantially permanent stress-induced deflection that can result when fabricating the probe, also referred to herein as “static bending.”

These concepts must not be confused. With respect to “operational deflection,” the degree of deflection of the cantilever during AFM data acquisition is measured by the translation of a laser beam (reflected from the cantilever) on a photodetector. This deflection is indicative of a characteristic (e.g., surface topography) of the sample.

On the other hand, the stress-induced deflection addressed by the present invention is a completely independent concept from the deflection of the cantilever caused by tip-sample interaction during AFM operation. Again, static bending results when fabricating the probe. For instance, different films or coatings applied to the surface of the cantilever during its construction, which improve or enable various features of the probe, have a tendency to cause surface stress and undesirably bend the cantilever. When a cantilever exhibiting this surface stress is placed in an AFM, the accuracy of the AFM is therefore compromised. It is this problem that is addressed by the present invention.

**B. § 102(e) Claim Rejections Based on *Daniels et al.***

The Examiner has rejected claim 1 based on *Daniels et al.* (“*Daniels*”), stating that the *Daniels* reference discloses a method of compensating for stress-induced deflection in a probe, citing col. 6, lines 28 – 45. However, the *Daniels* reference has nothing to do with compensating for static bending caused during probe fabrication. *Daniels* addresses the problems associated with condensation droplets forming on the cantilever, a problem completely separate from undesirable static bending of the cantilever produced as a result of probe fabrication. In fact, the cited language from *Daniels* only concerns deflection of the cantilever during use, i.e., when the cantilever deflects in response to tip-sample interaction during operation, again not a stress-induced deflection.

The Examiner also cites col. 6, lines 13 – 27 for the proposition that the probe of the *Daniels* reference is mounted so as to compensate for stress-induced deflection. Applicant respectfully disagrees. The cited excerpt is a mere explanation of well-known AFM operation using feedback control based on cantilever deflection; in other words, operational deflection that occurs “during normal operation of the AFM to control interaction (e.g., deflection or oscillation) of the probe 17 relative to the sample 3 so as to maintain the interaction substantially constant.” Col. 6, lines 21 – 26.

Claim 1 of the present preferred embodiments is not directed to monitoring operational deflection to control tip-sample interaction, but rather compensating for a static stress-induced deflection before the AFM is ever operated. Therefore, claim 1 is clearly allowable over *Daniels* and an indication to that effect is respectfully requested.

### C. § 102(b) Claim Rejections Based on *Quate*

The Examiner has rejected claim 15 based on the disclosure of *Quate*, citing col. 5, lines 5 – 15 and col. 6, lines 1 – 8. However, as with the *Daniels* reference discussed above, the *Quate* reference does not address the problem of static, stress-induced deflection, and only refers to cantilever deflection in the context of normal AFM operation. Static bending or deflection of probes is not disclosed anywhere in *Quate*, much less solutions to solve the associated problem.

Again, since claim 15 is directed to compensating for stress-induced, or static, deflection, the disclosures of *Quate*, which have nothing to do with this problem, cannot anticipate claim 15. Furthermore, nowhere in the cited sections of *Quate*, nor indeed in any section of *Quate*, is a compensation piece such as claimed in claim 15 disclosed. It is therefore believed that claim 15 is allowable over *Quate*.

**D. § 103(a) Claim Rejections Based on *Quate* in view of *Daniels et al.***

It is clear from the preceding sections that neither *Daniels* nor *Quate* disclose the subject matter of the present invention in that both of those references are not directed to compensating for stress-induced deflection of a cantilever, and only consider deflection of the cantilever in the context of operational deflection during AFM use. The combination of those references does nothing to correct their deficiencies and cannot serve to obviate the present invention. Therefore, claims 16, 17, and 19 – 22 are similarly allowable over those references.

**E. Claims 26 – 35**

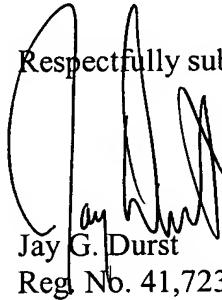
Although their status was not indicated by the Examiner, Applicant wishes to point out that the same arguments made with respect to claims 1, 15, 16, 17, and 19 – 22 apply equally to claims 26 – 35. Claims 26 – 35 are directed to solving the problem of stress-induced deflection. Claims 26 – 35 should therefore likewise be considered allowable.

## CONCLUSION

In light of the foregoing, Applicant believes that each of claims 1 – 25 is allowable.

Claims 26 – 35 are also believed to be in condition for allowance. The Applicant respectfully requests such actions, and invites the Examiner to contact the undersigned at the telephone number appearing below if any questions remain.

The Director is authorized to direct any additional fees associated with this or any other communication, or credit any overpayment, to Deposit Account 50-1170.

Respectfully submitted,  
  
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